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General Certificate of Secondary Education

Additional Science 4463 / Biology 4411

BLY2F Unit Biology 2

Report on the Examination

2010 Examination – June series

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Additional Science / Biology
Foundation Tier BLY2F

General

The great majority of candidates appear to have been entered for the appropriate examination tier.

Examiners report that the majority of candidates were reading the instructions in question stems more carefully than in the recent past, as answers were effectively focused on the questions asked, rather than incorrect interpretations of the information and/or the question. However there were notable exceptions, such as questions 5 (c) and parts of question 7.

The writing of most candidates was clear and very few were unable to be given credit because the examiner could not read their writing. However, the quality of some candidates' expression made their answers ambiguous and may not have resulted in the credit they may have deserved, had they been a little more careful about how they constructed sentences In particular, the use of the word it often leaves examiners having to make decisions as to what candidates are referring. Candidates should be encouraged to avoid the use of this word wherever possible, so that their responses are quite clear. Perhaps spending more time reading through answers slowly and carefully, rather than taking the odd cursory glance at what they have written would also help to overcome this problem.

Question 1 *(Low Demand)*

On the whole candidates made a solid start to the paper, with most securing at least four of the five marks on offer in this question.

(a) (i) There were several possible clues to aid the selection of the correct pair of cells; the labelled root hair and chloroplast as well as the drawn cell wall and vacuole, consequently the vast majority of candidates correctly selected the third alternative.

(a) (ii) This part proved a little more difficult, with cell membrane proving a much more attractive distracter than nucleus. Even so, nearly three quarters of candidates correctly selected cell wall.

(b) (i) Recognition that the sperm cell is adapted for swimming was well known by a high proportion of candidates.

(b) (ii) It less well known that the labelled chloroplasts would allow cell D to carry out photosynthesis and produce glucose but most still gained the mark, here. Those that made errors rarely selected cell A.

(c) That there remains confusion as to what gases are used and released during basic metabolic processes was evident in responses with the majority of incorrect answers being photosynthesis

Question 2 *(Low Demand)*

In recent examinations, questions on this topic which require prose answers have revealed a degree of confusion as to exactly what is being decayed, by which organisms and how. However, the closed format in this question created fewer problems, as candidates did not have to organise their thoughts into a single coherent response.

(a) Most candidates correctly identified microorganisms.

(b) This proved to be a little more difficult, most candidates avoided cold although dry was not an uncommon choice.

(c) Part (c) was the most difficult part of this question. Perhaps as in question 1 (c) candidates are confused between the inputs and outputs of the basic metabolic processes.

(d) Most candidates, who didn't know the answer, appeared to read the question sufficiently carefully to recognise the clue soil in the sentence and picked out roots for their answer.

Question 3 ***(Low Demand)***

(a) (i) Over sixty percent of candidates correctly linked all three substrates with the correct enzymes.

Those who made errors were much more likely to get two wrong, rather than just one, perhaps showing an element of guesswork, rather than logic. Perhaps the prefixes of protein and protease helped some candidates as, when candidates made errors, this was the pair most commonly correctly linked, with the enzymes responsible for the digestion of starch and fat being less commonly matched.

The examiners were pleased to note that relatively few candidates lost marks by drawing more than three lines, although some left a certain degree of speculation in examiners' minds by leaving their lines considerably short of the boxes.

(a) (ii) It was surprising how many candidates missed the clues in the words for the breakdown products of fats, often choosing the much less likely fructose.

Disappointingly less than half of candidates scored for all three answers here, there being an apparently high degree of guesswork, with some selecting amino acids for all three, perhaps in the hope that at least one would be correct.

(b) The stomach proved to be almost as popular as the liver as the source of bile.

Question 4 ***(Low Demand)***

Examiners were pleased with the generally good response to this question, in an area that has traditionally proved difficult at this level.

(a) (i) Perhaps the lack of an obvious space, lines or a box, in which to give an answer led to a significant minority of candidates not attempting this part.

Those who did, generally selected the correct symbol from the key, however there were some who decided to confer Harriet with only half of the disorder shading in only half of their shape, perhaps not understanding the dominant nature of the disorder and attempting to show Harriet to be heterozygous. A few drew symbols next to the question, and despite the emboldened instruction these were marked appropriately.

(a) (ii) Most candidates drew pairs of symbols and many of these were correct. Although a few used letters of their own choice these were treated on the basis of the usual convention of upper and lower case symbols.

(b) (i) The reason for screening was well known. Incorrect answers were equally divided between curing the disorder and checking the sex of the embryo.

(b) (ii) Candidates appeared to be less confident with this part. Many correct responses about possible harm to the embryo or mother were seen. Ideas about screening leading to difficult decisions about abortion were also given credit. However references to playing God and the process being unnatural were considered to be insufficient to gain credit although they were seen far less frequently this time. Cultural objections needed to be linked to religious, moral or ethical references in order to gain the mark. Candidates often confused ethical and ethnic. The unreliability of results, expense and possible prejudice were ignored unless qualified by other creditworthy information. No credit was given for the idea that parents wanted a surprise when their child was born.

A few candidates had not read this question carefully and answered in terms of embryos in laboratories being destroyed, which was incorrect in this context. This did show that centres use the papers from previous sessions during revision; however, candidates need to be aware that questions will have a different slant, so the answer to last year's question will not necessarily satisfy this year's question.

Question 5 *(Low Demand)*

(a) Pancreas was the correct response of most candidates, though a significant number thought that the liver produced insulin.

(b) References to diet and the correct way that it might be changed, exercise and examples of, such as going for a run, were creditworthy and were seen often. References to fats and proteins were ignored, but giving diabetics less salt was incorrect, as candidates were clearly either guessing or confused with other disorders they had met in their studies.

There are still a disturbing number of candidates who would give diabetics more sugar. Several candidates stated the diabetics should eat nothing. Those who said that diabetics should drink more water were giving a symptom not a treatment and so did not gain the mark. A few suggestions of pancreas transplant were seen and given credit, but liver transplants were incorrect.

(c) (i) Examiners were surprised by the relatively large number of candidates who attempted to give answers that would have been appropriate in part (c)(ii), with frequent comparisons between the numbers of males and females with diabetes in the various age groups. Examiners were able to disentangle many of these responses and give credit for correct relevant statements but it was clear that these candidates had not read the question carefully enough.

Examiners were looking for an increase and a decrease together with a correct data reference in order to award all three marks. Many answers included the increase and data and were awarded two of the marks. However, a common cause of the data mark being lost was quoting the scale incorrectly in thousands, rather than in numbers *per* thousand. Candidates should look at graph scales carefully before quoting them. There were many good, detailed answers in terms of the data, not only in terms of direct readings from the chart but also with calculations of the extent of increases and decrease.

(c) (ii) Although many candidates answered the question that was asked, a significant number appeared to misunderstand what was required, perhaps having already

given the information in part (c)(ii). Some apparently reversed the key and arrived at diametrically opposite answers to those expected, whilst others quoted the whole of the comparison in the first part, without referring to ages and disqualified their answer.

Question 6 *(Standard Demand)*

The examiners might have hoped that the majority of candidates would have experienced the investigation outlined in this question. However, it was frequently unclear whether this was the case.

(a) Weaker candidates struggled in this part often choosing one or other of the distracters, although considerably more than half selected the correct response.

(b) (i) A number of examiners indicated concern about the candidates' use of the vague term amount, when referring to length, volume, mass or number. However the examiners chose, on this occasion, to accept this sort of description as they were searching for an indication of understanding by the candidates, rather than the precise use of physical parameters. Hence, the amount of pondweed, however it was described was a commonly accepted correct answer

Unfortunately a considerable number of candidates then became confused between control variables, which are maintained throughout the investigation and the need to maintain the level of the independent variable at each stage. Hence the very common responses such as time and temperature were not accepted here.

There were frequent references to the amount of water but credit was not given, as the candidates did not identify that it was the amount of water *in the tube* that must be controlled. There were a few correct references to light, although neither intensity nor wavelength or colour were indicated and references to carbon dioxide were rare.

(b) (ii) Temperature was, again, a frequent incorrect answer. It was sometimes given along with count the number of bubbles per minute and therefore resulted in only one mark being awarded since this incorrect answer disqualified one of the two correct ideas. Some candidates gave instruments rather than what they would measure with them, so no credit could be given for answers such as stopwatch.

The number of bubbles was the commonest creditworthy answer, although the volume or amount of gas or oxygen was acceptable. The unqualified answer bubbles was insufficient for the mark due to the wording of the question. Some candidates disqualified their references to time by stating that it was the time until the bubbles started or stopped that should be measured. The time interval over which the bubbles were counted was the correct idea, but simply stating time was enough to gain the mark.

(c) (i) Temperature was the limiting factor, although references to too cold were accepted as indicating the correct understanding. Common incorrect answers were oxygen, carbon dioxide and water, perhaps garnered from part (c)(ii).

(c) (ii) Less than half the candidates chose carbon dioxide from the list in. Despite the list offered, some candidates gave other incorrect responses, once again indicating a need to read the question carefully.

Question 7 *(Standard Demand)*

The use of a Sankey diagram in this question may have been unfamiliar to some candidates, generating difficulty before they could attempt to answer the questions. Examiners often display data in a novel form and a Sankey diagram is a modified graph.

(a) (i) Fewer than half the candidates were able to deduce that the arrow for energy released in respiration was exactly half the width of the total energy intake of 40MJ. Those who tried complex calculations often failed to realise that each small square on the grid represented 2MJ, and arrived at an answer of 10, rather than 20MJ, This same error was often continued into part (a)(ii)

(a) (ii) A significant proportion of candidates made no attempt at this part. Answers from those who did often contained indecipherable mathematics resulting in all kinds of incorrect answers, some of which were particularly unlikely, resulting in more energy used for growth than was originally taken in by the animal. Candidates should be encouraged to look at the answers generated by their workings out, and decide whether they are, at least, logical.

(b) There was a wide range of answers, many appearing to be lists of any processes the candidates knew including sleeping. Breathing was a common acceptable answer, though possibly prompted by the word respiration in the stem rather than understanding, as the candidates often gave an incorrect second response. Growth, repair and active transport were the correct responses of a few candidates.

Candidates are expected to use biological terms rather than colloquialisms for a variety of wastes which although incorrect answers to this question were seen frequently. Some candidates did not understand the question and answered in terms or food chains or plant growth and scored no marks, whilst others clearly believed that herbivores are plants, despite the first line of the question.

(c) Many candidates did not realise that this part required the idea that carnivores had to hunt for their food and gave other non-creditworthy responses such as more energy in meat than plants, eat more or meat is harder to digest some of which showed the candidate did not really understand the idea of proportion of energy.

(d) Many candidates gained credit for the idea that the animals moved less indoors. Some ideas about heat were confused and it was not clear whether candidates were describing the surroundings indoors being warmer than those outside, the animals producing less or more heat or whether candidates believed core temperature would be higher if animals were kept indoors. Ideas that show lack of clarity cannot usually gain credit.

A few candidates gained the mark for less respiration but others disqualified their answer by stating that there was less energy used *for* respiration. Ideas about the amount of food provided for animals and less waste being produced were ignored in this question, though candidates did often refer to the diet of these animals.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the **Results statistics** page of the AQA Website.